IN THE CLAIMS:

1.-5. (Cancelled)

6. (Currently Amended) A method for maintaining a plurality of virtual servers within a server, ~~the method~~ comprising ~~the steps of~~:

partitioning resources of the server to establish an instance of each virtual server by allocating units of storage and network addresses of network interfaces of the server to each instance of the virtual server, and sharing an operating system and a file system of the server among all of the virtual servers,~~;~~ wherein a selected virtual server is established by

_____storing external configuration information of ~~a~~ the selected virtual server of the plurality of virtual servers in a global repository maintained on a ~~disk~~ storage device of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers, the external resources including the units of storage and the network addresses assigned to the selected virtual server~~;~~ , and

_____storing internal configuration information of the selected virtual server of the plurality of virtual servers in a private repository, the private repository stored in the ~~one or more~~ units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server;

enabling controlled access to the resources using logical boundary checks and security interpretations of those resources within the server by comparing configuration information of a unit of storage requested by a particular virtual server with the resources allocated to that particular virtual server; and

providing a virtual server context structure including information pertaining to a security domain of the virtual server, the virtual server context structure stored in the internal configuration information.

7. (Previously Presented) The method of Claim 6 wherein the step of allocating comprises ~~the step of~~ providing a vfstore list of the virtual server context structure, the vstore list comprising pointers to vfstore soft objects, each having a pointer that references a path to a unit of storage allocated to the virtual server.

8. (Previously Presented) The method of Claim 7 wherein the step of allocating further comprises ~~the step of~~ providing a vfnet list of the virtual server context structure, the vfnet list comprising pointers to vfnet soft objects, each having a pointer that references an interface address data structure representing a network address assigned to the virtual server.

9. (Previously Presented) The method of Claim 8 wherein the step of enabling further comprises ~~the step of~~ performing a virtual server boundary check to verify that a virtual server is allowed to access certain storage resources of the filer.

10. (Original) The method of Claim 9 wherein the step of performing comprises ~~the step of~~ validating a file system identifier and qtree identifier associated with the units of storage.

11. (Previously Presented) The method of Claim 10 wherein the step of performing further comprises ~~the steps of~~:

for each request to access a unit of storage, using the identifiers to determine whether the virtual server is authorized to access the unit of storage;

if the virtual server is not authorized to access the requested unit of storage, immediately denying the request;

otherwise, allowing the request; and

generating file system operations to process the request.

12. (Cancelled)

13. (Currently Amended) A server, comprising:

an operating system configured to partition resources to a plurality of virtual servers (vservers) by storing external configuration information of a selected vserver of the plurality of vservers stored in a global repository maintained on a storage device of the server, the external configuration information describing external resources assigned to a vserver of the plurality of vservers, the external configuration information including network addresses allocated among each of the vservers, and storing internal configuration information of the selected virtual server of the plurality of virtual servers stored in a private repository, the private repository stored in one or more units of storage assigned to the vserver, the internal configuration information used to control operation of the selected vserver;

a storage media configured to store information as units of storage resources, the units of storage resources allocated among each of ~~a~~ the plurality of virtual servers ~~(vservers)~~;

one or more network interfaces each assigned one or more network address resources, the network address resources allocated among each of the virtual servers;

~~an~~ the operating system having a file system ~~resource~~, ~~adapted~~ the operating system further configured to perform a boundary check to verify that a request is allowed to access to certain units of storage resources on the storage media, each virtual server allowed shared access to the file system, where the boundary check is performed by comparing configuration information of a unit of storage requested by a particular vserver with the one or more units of storage resources and the one or more network address resources allocated to that particular vserver;

a context data structure provided to each virtual server, the context data structure including information pertaining to a security domain of the virtual server that enforces controlled access to the allocated and shared resources, wherein the context data structure is stored in the internal configuration information; and

~~external configuration information of a selected vserver of the plurality of vservers stored in a global repository maintained on a disk of the server, the external configuration information describing external resources assigned to a vserver of the plurality of vservers, the external configuration information including the network addresses allocated among the each of the vservers;~~

~~internal configuration information of the selected virtual server of the plurality of virtual servers stored in a private repository, the private repository stored in the one or more units of storage assigned to the vserver, the internal configuration information used to control operation of the selected vserver, the context data structure stored in the internal configuration information; and~~

a processing element coupled to the network interfaces and storage media, and configured to execute the operating and file systems to thereby invoke network and storage access operations in accordance with results of the boundary check of the file system.

14. (Original) The system of Claim 13 wherein the units of storage resources are volumes and qtrees.

15. (Original) The system of Claim 14 further comprising a plurality of table data structures accessed by the processing element to implement the boundary check, the table data structures including a first table having a plurality of first entries, each associated with a virtual server and accessed by a file system identifier (fsid) functioning as a first key into the table, each first entry of the first table denoting a virtual server that completely owns a volume identified by the fsid.

16. (Original) The system of Claim 15 wherein the table data structures further include a second table having a plurality of second entries, each associated with a virtual server and accessed by a second key consisting of an fsid and a qtree identifier (qtreeid), each second entry of the second table denoting a virtual server that completely owns a qtree identified by the fsid and qtreeid.

17. (Original) The system of Claim 16 wherein the server is a filer and wherein the virtual servers are virtual filers.

18.-19. (Cancelled)

20. (Currently Amended) A server, comprising:

means for allocating dedicated resources of the server to each virtual server (vserver) of a plurality of vservers executing on the server by storing external configuration information of a selected vserver of the plurality of vservers stored in a global repository maintained on a storage device of the server, the external configuration information describing external resources assigned to a vserver of the plurality of vservers, the external resources including the means for allocating the dedicated resources, and storing internal configuration information of the selected vserver of the plurality of vservers

stored in a private repository, the private repository stored in one or more units of storage assigned to the vserver, the internal configuration information used to control operation of the selected vserver;

means for sharing common resources of the server among all of the vservers; and

means for enabling controlled access to the dedicated and shared resources using logical boundary checks and security interpretations of those resources within the server and for providing a vserver context structure including information pertaining to a security domain of the vserver, where the logical boundary checks are performed by comparing configuration information of a unit of storage requested by a particular vserver with the dedicated resources allocated to that particular vserver~~;~~, wherein the vserver context structure is stored with the internal configuration information.

~~external configuration information of a selected vserver of the plurality of vservers stored in a global repository maintained on a disk of the server, the external configuration information describing external resources assigned to a vserver of the plurality of vservers, the external resources including the means for allocating the dedicated resources; and~~

~~internal configuration information of the selected vserver of the plurality of vservers stored in a private repository, the private repository stored in the one or more units of storage assigned to the vserver, the internal configuration information used to control operation of the selected vserver, the internal configuration information including the vserver context structure.~~

21.-22. (Cancelled)

23. (Currently Amended) A computer readable medium containing executable program instructions for creating and maintaining a plurality of virtual servers (vservers) within a server, the executable program instructions comprising program instructions for:

allocating dedicated resources of the server to each vserver by storing external configuration information of a selected vserver of the plurality of vservers stored in a global repository maintained on a storage device of the server, the external configuration information describing external resources assigned to a vserver of the plurality of vservers, the external resources including the dedicated resources, and storing internal configuration information of the selected vserver of the plurality of vservers stored in a private repository, the private repository stored in the one or more units of storage assigned to the vserver, the internal configuration information used to control operation of the selected vserver, the internal configuration information including the configuration information of a unit of storage;

sharing common resources of the server among all of the vservers; and

enabling access to the dedicated and shared resources using logical boundary checks and security interpretations of those resources within the server and providing a vserver context structure including information pertaining to a security domain of the vserver, where the logical boundary checks are performed by comparing configuration information of a unit of storage requested by a particular vserver with the dedicated resources allocated to that particular vserver;.

~~storing external configuration information of a selected vserver of the plurality of vservers in a global repository maintained on a disk of the server, the external configuration information describing external resources assigned to a vserver of the plurality of vservers, the external resources including allocation of the dedicated resources; and~~

~~storing internal configuration information of the selected vserver of the plurality of vservers in a private repository, the private repository stored in the one or more units of storage assigned to the vserver, the internal configuration information used to control operation of the selected vserver, the internal configuration information including the configuration information of a unit of storage~~.

24.-25. (Cancelled)

26. (Currently Amended) A method for maintaining a plurality of virtual servers (vserver) within a server, comprising:

allocating resources to each instance of the virtual servers of the plurality of servers, the resources including units of storage and network addresses of network interfaces of the server to each instance of the virtual server by storing external configuration information of a selected virtual server of the plurality of virtual servers in a global repository maintained on a storage device of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers, the external resources including network addresses, and storing internal configuration information of the selected virtual server of the plurality of virtual servers in a private repository, the private repository stored in one or more units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server, the internal configuration information including configuration information of a unit of storage; and

using boundary checks to access resources allocated to the virtual servers, where a particular virtual server is limited by the boundary check to only access the resources assigned to that particular virtual server, where the logical boundary checks are performed by comparing configuration information of ~~a~~ the unit of storage requested by a particular vserver with the resources allocated to that particular vserver~~;~~.

~~storing external configuration information of a selected virtual server of the plurality of virtual servers in a global repository maintained on a disk of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers, the external resources including the network addresses; and~~

~~storing internal configuration information of the selected virtual server of the plurality of virtual servers in a private repository, the private repository stored in the one or more units of storage assigned to the virtual server, the internal configuration information~~

~~used to control operation of the selected virtual server, the internal configuration information including configuration information of a unit of storage.~~

27. (Currently Amended) A server, comprising:

means for allocating resources to each instance of a virtual server of a plurality of virtual servers executing on the server, the resources including units of storage and network addresses of network interfaces of the server to each instance of the virtual server by storing external configuration information of a selected virtual server of the plurality of virtual servers in a global repository maintained on a storage device of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers, the external resources including the network addresses, and storing internal configuration information of the selected virtual server of the plurality of virtual servers in a private repository, the private repository stored in one or more units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server, the internal configuration information including configuration information of a unit of storage; and

means for using boundary checks to access resources allocated to the virtual servers, where a particular virtual server is limited by the boundary check to only access the resources assigned to that particular virtual server, where the logical boundary checks are performed by comparing configuration information of ~~a~~ the unit of storage requested by a particular vserver with the resources allocated to that particular vserver~~;~~.

~~means for storing external configuration information of a selected virtual server of the plurality of virtual servers in a global repository maintained on a disk of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers, the external resources including the network addresses; and~~

~~means for storing internal configuration information of the selected virtual server of the plurality of virtual servers in a private repository, the private repository stored in~~

~~the one or more units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server, the internal configuration information including configuration information of a unit of storage.~~

28. (Currently Amended) A server, comprising:

a storage media configured to allocate resources to each virtual server of a plurality of virtual servers executing on the server, the resources including units of storage and network addresses of network interfaces of the server to each instance of the virtual server network interfaces assigned one or more network address resources, the network address resources allocated among each of the virtual servers, wherein the resources are allocated to each virtual server by storing external configuration information of a selected virtual server of the plurality of virtual servers stored in a global repository maintained on a storage device of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers, the configuration information including the units of storage, and storing internal configuration information of the selected virtual server of the plurality of virtual servers stored in a private repository, the private repository stored in one or more units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server, the internal configuration information including the configuration information of a unit of storage; and

an operating system ~~adapted~~ configured to perform a boundary check to verify access to resources allocated to the virtual servers, where a particular virtual server is limited by the boundary check to only access the resources assigned to that particular virtual server, where the logical boundary checks are performed by comparing configuration information of ~~a~~ the unit of storage requested by a particular vserver with the resources allocated to that particular vserver~~;~~.

~~external configuration information of a selected virtual server of the plurality of virtual servers stored in a global repository maintained on a disk of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers, the configuration information including the units of storage; and~~

~~internal configuration information of the selected virtual server of the plurality of virtual servers stored in a private repository, the private repository stored in the one or more units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server, the internal configuration information including the configuration information of a unit of storage.~~

29. (Currently Amended) A method for maintaining one or more virtual servers within a server, comprising:

allocating resources to a first virtual server of the one or more virtual servers, where the resources include one or more units of storage and at least one network address of one or more network interfaces of the server to a first virtual server of the one or more virtual servers, wherein the resources are allocated by storing external configuration information of a selected virtual server of the plurality of virtual servers in a global repository maintained on a storage device of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers, the external configuration information including the one or more units of storage and at least one network address, and storing internal configuration information of the selected virtual server of the plurality of virtual servers in a private repository, the private repository stored in the one or more units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server, the internal configuration information including the configuration information;

requesting a first unit of storage of the one or more units of storage by a first virtual server; and

using a boundary check to access the first unit of storage by comparing configuration information of the first unit of storage with resources allocated to the first virtual server~~;~~.

~~storing external configuration information of a selected virtual server of the plurality of virtual servers in a global repository maintained on a disk of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers, the external configuration information including the one or more units of storage and at least one network address; and~~

~~storing internal configuration information of the selected virtual server of the plurality of virtual servers in a private repository, the private repository stored in the one or more units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server, the internal configuration information including the configuration information.~~

30. (Previously Presented) The method of claim 29, wherein the configuration information is an inode from a requested file.

31. (Currently Amended) A method for maintaining a plurality of virtual servers on a server, comprising:

storing external configuration information of a selected virtual server of the plurality of virtual servers in a global repository maintained on a storage device~~disk~~ of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers;

storing internal configuration information of the selected virtual server of the plurality of virtual servers in a private repository, the private repository stored in ~~the~~ one or more units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server; and

maintaining security domain information in the internal configuration information, wherein the security domain information is used to control access to the selected virtual server.

32. (Previously Presented) The method of claim 31, further comprising:
storing the global repository in a root node of the server.

33. (Previously Presented) The method of claim 31, further comprising:
including in the external configuration information one or more IP addresses.

34. (Previously Presented) The method of claim 31, further comprising:
including in the external configuration information identification of one or more units of storage.

35. (Previously Presented) The method of claim 31, further comprising:
including in the external configuration information a volume identification to identify a file system executing the selected virtual server.

36. (Previously Presented) The method of claim 31, further comprising:
including in the external configuration information protocols allowed to run on the selected virtual server.

37. (Previously Presented) The method of claim 31, further comprising:
including the internal configuration information in a virtual server context data structure stored in storage space assigned to the virtual server.

38. (Previously Presented) The method of claim 31, further comprising:
including in the internal configuration information a pointer to software associated with hardware assigned to the virtual server in the global repository.

39. (Previously Presented) The method of claim 31, further comprising:
including in the internal configuration information a pointer to software associated with an IP address assigned to the virtual server in the global repository.

40. (Previously Presented) The method of claim 31, further comprising:
including in the internal configuration information a pointer to software associated with a unit of storage assigned to the virtual server in the global repository.

41. (Previously Presented) The method of claim 31, further comprising:
including in the internal configuration information a pointer to software associated with a protocol assigned to the virtual server in the global repository.

42. (Previously Presented) The method of claim 31, further comprising:
including in the internal configuration information a pointer to software associated with a security domain assigned to the virtual server in the global repository.

43. (Previously Presented) The method of claim 31, further comprising:
including in the internal configuration information a pointer to software associated with a security data base holding security information assigned to the virtual server.

44. (Previously Presented) The method of claim 31, further comprising:
including in the internal configuration information a pointer to software associated with storage units which the virtual server is permitted to access to enable the virtual server to perform boundary checks when accessing storage blocks.

45. (Previously Presented) The method of claim 31, further comprising:
including in the internal configuration information a pointer to software associated with a file system identification (fsid) table, the fsid serving as an index into the

fsid table to an entry indicating whether or not the virtual server completely owns a unit of storage, and in the event that the entry in the fsid table indicates that the virtual server does completely own the unit of storage, permitting the virtual server access to the unit of storage.

46. (Previously Presented) The method of claim 31, further comprising:

including in the internal configuration information a pointer to software associated with a file system identification (fsid) table, the fsid serving as an index into the fsid table to an entry indicating whether or not the virtual server completely owns a unit of storage, and in the event that the entry in the fsid table indicates that a different virtual server does completely own the unit of storage, denying the virtual server access to the unit of storage.

47. (Previously Presented) The method of claim 46, further comprising:

in the event that the virtual server does not completely own the unit of storage and in the event that no different virtual server completely owns the unit of storage, entering a qtree table using a qtree to the unit of storage to determine if the virtual server owns the qtree to the unit of storage, and if the virtual server does own the qtree to the unit of storage, providing access by the virtual server to the unit of storage.

48. (Currently Amended) The method of claim 31, further comprising:

receiving an authentication request, the authentication request requiring contacting an external server; and

reading from the internal configuration information a process identification (PID) that enables an operating system to send an authentication request to ~~the~~ a correct authentication process.

49. (Currently Amended) A server, comprising:

a plurality of virtual servers executing on the server;

an operating system executed by a processor within the server, where the operating system is configured to store external configuration information of a selected virtual server of the plurality of virtual servers stored in a global repository maintained on a storage device~~disk~~ of the server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers~~;~~, and to store ~~—~~internal configuration information of the selected virtual server of the plurality of virtual servers stored in a private repository, the private repository stored in ~~the~~ one or more units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server; and

security domain information maintained in the internal configuration information, wherein the security domain information is used to control access to the selected virtual server.

50. (Currently Amended) The ~~method~~ server of claim 49, ~~further comprising:~~wherein ~~an~~ the operating system is further configured to store the global repository in a root node of the server.

51. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~

~~an~~ wherein the operating system further configured to store in the external configuration information one or more IP addresses.

52. (Currently Amended) The server ~~method~~ of claim 49, wherein the ~~further comprising:~~

~~an~~ operating system further configured to include in the external configuration information identification of one or more units of storage.

53. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~

~~an~~ wherein the operating system further configured to include in the external configuration information a volume identification to identify a file system executing the selected virtual server.

54. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~

~~an~~ wherein the operating system further configured to include in the external configuration information protocols allowed to run on the selected virtual server.

55. (Currently Amended) The server ~~method~~ of claim 49, wherein the~~further comprising:~~

~~an~~ operating system further configured to include the internal configuration information in a virtual server context data structure stored in storage space assigned to the virtual server.

56. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~

~~an~~ wherein the operating system further configured to include in the internal configuration information a pointer to software associated with hardware assigned to the virtual server in the global repository.

57. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~

~~an~~ wherein the operating system further configured to include in the internal configuration information a pointer to software associated with an IP address assigned to the virtual server in the global repository.

58. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~

~~an~~ wherein the operating system further configured to include in the internal configuration information a pointer to software associated with a unit of storage assigned to the virtual server in the global repository.

59. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~ ~~an~~ wherein the operating system further configured to include in the internal configuration information a pointer to software associated with a protocol assigned to the virtual server in the global repository.

60. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~ ~~an~~ wherein the operating system further configured to include in the internal configuration information a pointer to software associated with a security domain assigned to the virtual server in the global repository.

61. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~ ~~an~~ wherein the operating system further configured to include in the internal configuration information a pointer to software associated with a security data base holding security information assigned to the virtual server.

62. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~ ~~an~~ wherein the operating system further configured to include in the internal configuration information a pointer to software associated with storage units which the virtual server is permitted to access to enable the virtual server to perform boundary checks when accessing storage blocks.

63. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~ ~~an~~ wherein the operating system further configured to include in the internal configuration information a pointer to software associated with a file system identification (fsid) table, the fsid serving as an index into the fsid table to an entry indicating whether or not the virtual server completely owns a unit of storage, and in the event that the entry in the fsid table indicates that the virtual server does completely own the unit of storage, permitting the virtual server access to the unit of storage.

64. (Currently Amended) The server ~~method~~ of claim 49, ~~further comprising:~~

~~an~~ wherein the operating system further configured to include in the internal configuration information a pointer to software associated with a file system identification (fsid) table, the fsid serving as an index into the fsid table to an entry indicating whether or not the virtual server completely owns a unit of storage, and in the event that the entry in the fsid table indicates that a different virtual server does completely own the unit of storage, the operating system to deny the virtual server access to the unit of storage.

65. (Currently Amended) The server ~~method~~ of claim 64, further comprising:

in the event that the virtual server does not completely own the unit of storage and in the event that no different virtual server completely owns the unit of storage, the operating system to enter a qtree table using a qtree to the unit of storage to determine if the virtual server owns the qtree to the unit of storage, and if the virtual server does own the qtree to the unit of storage, the operating system to provide access by the virtual server to the unit of storage.

66. (Currently Amended) The server ~~method~~ of claim 49, further comprising:

~~an~~ the operating system further configured to receive an authentication request, the authentication request requiring contacting an external server; and

the operating system to read from the internal configuration information a process identification (PID) that enables an operating system to send an authentication request to ~~the~~ a correct authentication process.

67. (Currently Amended) A computer readable media, comprising:

said computer readable media containing instructions for execution on a processor for the practice of a method of maintaining a plurality of virtual servers on a server, the method having the steps of,

storing external configuration information of a selected virtual server of the plurality of virtual servers in a global repository maintained on a storage device~~disk~~ of the

server, the external configuration information describing external resources assigned to a virtual server of the plurality of virtual servers;

storing internal configuration information of the selected virtual server of the plurality of virtual servers in a private repository, the private repository stored in ~~the~~ one or more units of storage assigned to the virtual server, the internal configuration information used to control operation of the selected virtual server; and

maintaining security domain information in the internal configuration information, wherein the security domain information is used to control access to the selected virtual server.